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EXAMINER

SOUW, BERNARD E

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/080,879

Applicant(s)

TRUCHE ET AL.

Examiner

Bernard E Souw

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 and 49-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-47 and 49-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 7a.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Applicant's Amendments

1. The Amendment A, Paper No. 6/a, filed on 03/28/2003, has been entered. The present Office Action is made with all the suggested amendments being fully considered.

New Abstract has been substituted, and the specification has been amended.

Claim 48 has been cancelled, and new claims 55 to 59 have been added.

Consequently, pending in this Office Action are claims 1-47 and 49-59, i.e., a total of 58 claims.

Examiner's Comments on Applicant's Amendments

Drawings

2. The drawing correction of Fig.7 proposed in Paper No.4 filed 03/28/2003, i.e., omitting the label "*Prior Art*", is not approved by the Examiner, because it is now declared as an "*alternate device*" as amended per Amendment A (Paper No.6/A), pg.2, lines 3-10 from bottom. The new declaration of Fig.7 is invalid, because the device shown in Fig.7 **does not work**, as admitted in Amendment A, page 11, paragraph 3, lines 7-8, and expressly conceded by the Applicant's Attorney, Mr. Aaron C. Deditch (Reg. No. 33,865) during a phone interview conducted sometime in May 2003. Applicant's own failure, or failed trial, belongs neither to a Prior Art nor an "*alternate*

device". As indicated by the Applicant's Attorney, the Fig.7 -- as well as all references thereto -- should be eliminated altogether and removed from the disclosure.

Examiner's Comments on Applicant's Amendments

Specification

3. The amendment made to the specification has been carefully reconsidered with respect to the previous objections. However, it fails to remove some of the previous objections, as follows:

(a) The substitute text referring to Fig.7 on page 11 of the disclosure *fails* to indicate that the device depicted in Fig.7 is a *failure* made by the Applicant, as admitted in Amendment A, page 11, paragraph 3, lines 7-8, and also conceded to the Examiner by Applicant's Attorney, Mr. Aaron C. Deditch, in a telephone interview recited above. Therefore, section 2 of the previous objections remains in force.

(c) The amended specification fails to correct the statement objected to on page 12, line 9, of the disclosure, regarding the recitation "*This result is quite unexpected*", for being misleading & deceptive. The reason why a heated gas would have effect on a desolvation of analyte ions from matrix substance and a break-up of molecular clusters, is not "unknown" as understood by Applicant, but very well known to one of ordinary skill in the art, as taught by Willoughby-885 (USPAT # 4,968,885), showing in Fig.5 a conduit 67 for heating the target 50, as recited in Col.14/II.4-16, by directing an alternative energy source (including a heated gas, as generally known in the art), to the target surface 50, as recited in Col.145/II.45-50. It is also taught by Laiko-II (IDS), as

recited on pg.5240/Col.2/lines 11-16. The reason why Applicant's arrangement of Fig.7 has failed is also quite obvious to one of ordinary skill in the art, and hence, such arrangement should not have been attempted at all. Therefore, section 5 of the previous objections remains in force.

(d) Regarding section 7 of previous Office Action, the important question regarding whether the "*enhanced ion intensities between $m/z=700$ and $m/z=2000$ observed by Applicant were not just showing broken-down matrix ions*" (words in *italics* were copied from previous Office Action, page 8, lines 5-6 from bottom) has not been addressed. Applicant remains silent on an Examiner's request of an affidavit, or additional explanation, that Applicant has *adequately considered* this possibility and *appropriately ruled it out*, as generally practiced in the art. This also refers to Applicant's confusion expressed in Amendment A, page 11/lines 1-3 from bottom, which demonstrates Applicant's ignorance of a general practice and convention in science and technology. Applicant's failure to follow this technical convention and general practice in the art is a proof for Applicant's unprofessional manner. Therefore, section 7 of the previous objection persists.

(e) Section 8 of the previous Office Action (referring to several errors on page 14/lines 8-9) having not been addressed, the previous *objection* to the specification for using several technically indefinite, and hence, unprofessional terminologies, remains in force.

(f) Section 9 of the previous Office Action (referring to the disclosure, page 14/line 11 regarding the words "*easily detectable*") having not been addressed, the previous

objection to the specification for using a technically indefinite and unprofessional terminology remains intact.

(g) The remaining objections to the specifications raised in the previous Office Action are now withdrawn, either due to Applicant's argument(s), or to a New Ground of Rejection raised in the present Office Action.

Withdrawal of Previous 35 USC § 112 Claim Rejections

4. In consequence of Applicant's accepted arguments, the previous rejections under §112, 1st and 2nd paragraphs, of claims 11, 39, 40, 48 and 52 based on a missing mass analyzer are, now withdrawn.

5. Just in order not to waste time on irrelevant arguments, the previous *rejections* under §112, 2nd paragraph, of claims 1, 11, 36-39, 41-45, 47, 49-50 and 52-54, based on the use of technically indefinite word "*ion enhancement*" are now withdrawn, also in reference to the above discussion.

6. Again, just in order not to waste time on irrelevant arguments, the previous *rejections* under §112, 2nd paragraph, of claims 11, 38, 39, 47 and 52, based on the use of technically indefinite word "*ease of detection*" are now withdrawn, also in reference to the above discussion.

7. Claims 11 and 47 having been appropriately amended, their previous rejections under §112, 2nd paragraph, are now withdrawn.

8. Claims 1, 11 and 52 having been appropriately amended, their previous rejections under §112, 2nd paragraph, are now withdrawn.

Response to Applicant's Arguments

Applicant's arguments raised in Amendment A (Paper No.6/A) have been fully considered. The following is the Examiner's response.

9. Applicant's argument on page 6, Paper No.6/A, regarding Agilent 5973 MSD (Mass Selective Detector) is acceptable (see also Response to Applicant's Arguments in this Office Action). In this regard, Applicant's definition of a "*detector*" that inherently includes a mass analyzer or spectrometer has indeed been unambiguously defined in the disclosure on page 7, lines 19-22 (but **not** in lines 26-30, as argued by Applicant, which is unacceptable).

10. Claim 53 remains an allowable subject matter (see Conclusion). However, it is important to point out that Applicant's "*evidence*" for ion enhancement, given in response to the Examiner's request in the previous Office Action (page 18, section 41, lines 5-6), as recited in Amendment A (page 6, lines 11-15, and page 11, paragraph 3, lines 1-5 from the end), i.e., by merely referring to *Applicant's own failed attempt* depicted in Fig.7, is ***totally invalid***.

Requested by the Examiner was Applicant's evidence (beyond verbal claims) for an ion enhancement *solely caused by gas-to-gas contact without heating the collecting*

capillary. Instead of evidence, Applicant refers to *Applicant's own failed attempt* depicted in Fig.7. Valid as evidence is not what Applicant has failed to do. What really matters is solely what Applicant can do. A mere fact that Applicant's invention can do "*better*" than a senseless attempt that previously failed, does not lend any patentability to the claim.

11. To avoid wasting time, previous §112 rejections of claims 1, 11, 36-39, 41-45, 47, 49-50 and 52-54, based on the use of *technically indefinite and/or unprofessional terminologies*, have been withdrawn, although their previous objections are still in force, for the sake of preserving the general convention and custom in science and technology. However, Applicant's unprofessional manner does not affect the patentability of Applicant's invention.

12. Notwithstanding Applicant's verbal argument (without evidence) on pg.3/lines 17-22 and non-responsive argument based on "*not-understood*" objection expressed in Amendment A, page 11/lines 1-3 from bottom, one of ordinary skill in the art cannot be convinced, whether the "*enhanced ion intensities between $m/z=700$ and $m/z=2000$ observed by Applicant*" were really caused by heat-induced break-up of bio-molecule clusters, and not just showing "*broken-down matrix ions*" (this is a repeat: words in *italics* were copied from previous Office Action, page 8, lines 5-6 from bottom). In contrast, the cited prior art, Danell et al., has ruled out the latter, as expressly pointed out in the "Results" section, lines 8-9 from bottom, which was already recited in the

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previous Office Action. Such a consideration, expressed in a statement ruling out the undesired possibility, is imperative to every scientific/technical invention that is worth of (refereed) publication, and is also required to obtain patent rights, in order to rule out a § 101 case. In this regard, Applicant is completely silent of such a consideration, thus raising serious doubt, is it forgotten by Applicant, or is Applicant unaware of its importance due to the level of his skill in the art?

It is a substantial waste of time for the Examiner to have to repeat what has been clearly stated in the previous Office Action. Applicant's remarks as cited above clearly indicates that Applicant has not forgotten to address the issue, but was in fact unaware of its importance due to whatever level of his skill in the art. This also demonstrates Applicant's ignorance of a general practice and convention in science and technology, which is in accordance with the generally unprofessional and non-technical manner and attitude shown in the disclosure as well as in Applicant's Response. In consequence, Applicant's traversal of the Examiner's objection, as expressed in Amendment A, page 11, lines 1-3 from bottom, is not accepted.

Note: Applicant may deliberately refuse to answer the Examiner's request for affidavit or additional explanation in the specification. However, Applicant is still obligated to unambiguously declare his refusal, and should not try to sweep it under a carpet of alleged misunderstanding, like what is happening so far. Such a declared refusal would inevitably lead to an unpatentability of the claims, and probably to the entire invention, for making claim on an effect that does not exist, or an invention that does not work as specified (i.e., under U.S.C. § 101).

13. Applicant's dismissal of Examiner's assertion based on Agilent 1100 and 5902 Magnum Electron Multiplier as being "wholly misplaced" (Paper No. 6/A, page 10), is unacceptable, since the two brochures are both centered exactly on the subject matter of dispute, i.e., Mass Spectrometer and Detector. However, as already stated above, Applicant's definition of a "*detector*" that inherently includes a mass analyzer or spectrometer has indeed been unambiguously defined in the disclosure on page 7, lines 19-22 (**not** in lines 26-30, as argued by Applicant, which is unacceptable). Therefore Applicant's definition is admissible, for being in compliance with the general MPEP guidelines.

14. In response to applicant's arguments against the reference of Danell individually, one cannot show nonobviousness by attacking references individually, where 35 U.S.C. 103(a) rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

15. Applicant's argument against the Buswell reference is futile, because Buswell et al. has been used merely as a support for Official Notice regarding Wilson Jr. (previous Office Action, pg.13, lines 5-6 from bottom). As a support for Official Notice, Buswell did not need have to be recited at all. It would have been sufficient to recite that Wilson's technique of coaxial heating is widely known in the art. Upon Applicant's inquiry, the

Examiner may then proceed by naming one or more references (not necessarily Buswell's), in which coaxial heating is used.

16. Applicant's argument against the Wilson reference, allegedly that Wilson reference is directed to a wholly different problem of heat exchange is unpersuasive, since heat exchange --including coaxial heat exchange-- is a conventional technique well-known in the art (Official Notice taken by the Examiner on pg.13 of previous Office Action, lines 5-7 from bottom). As such, the solution for specific problem(s) that may arise should be adequately known to those of ordinary skill in the art. Wilson's only difference to the present invention is the range of temperature, which has to be so chosen as to be high enough to break up molecular clusters, but low enough to avoid a further breakdown of the biomolecular analytes into smaller or elemental fragments. Such knowledge is provided by Willoughby (USPAT # 4,968,885), as recited in Col.14/ll.28-30 and Col.17/ll.8-25, which is here given as a support for the previously declared Official Notice, and hence, does not represent a new ground of rejection. The skill of manufacturing and operating a coaxial heat exchanger, designed for this specific temperature range, is well known in the art. It is here to be emphasized, that a standard of ordinary level of knowledge & skill in the art is by no means referred to the Applicant's, but instead, essentially independent thereof. In other words, it would be just "*too bad*", if Applicant is not in possession of such knowledge and skill.

17. Regarding § 103 rejections, Applicant's traversal of all claims amazingly occupies only two pages (pg 17-18) from the entire 17 pages (pg.6-22) of Applicant's Response (Paper No.6/A). They are *moot*, because of the new grounds of rejections presented in this Office Action. However, these new grounds of rejection do not prevent this Office Action to be made FINAL, since these new grounds of rejections are necessitated by Applicant's amendment of all the independent claims, i.e., claims 1, 11, 36, 38, 39 and 52, as stated in the Amendment A, Paper No.6/A. The finality of rejections applied to the dependent claims follows automatically, due to their dependencies to the rejected independent claims.

18. Regarding Applicant's arguments on pages 19-22, Applicant's traversal of Examiner's reason and/or motivation to combine the prior arts will be addressed in general, since its nature is independent of the specific prior art(s).

► Applicant's referral to the case law of *In re Kotzab* (55 USPQ 2d 1313, 1318, Federal Circuit 2000) concerning a "*technologically simple concept*", as recited in paper No.6/A, page 19, is wholly misplaced, since in no instance has the Examiner ever referred to the phraseology of "*technologically simple concept*"; neither has the Examiner ever referred to anything like the "*idea of a single sensor controlling multiple valves*", as alleged by Applicant. Applicant's lengthy argument is therefore moot, not only because of the new grounds of rejection presented in this Office Action.

Against Applicant's expectation, the Examiner would never "*fall into the hindsight trap*" [sic], as anticipated by Applicant in the left & right indented paragraph on page 19.

In the contrary, the Examiner even regards the "*idea of a single sensor controlling multiple valves*" may be more complex than a single sensor controlling a single valve, or a multiple sensors controlling a multiple valves, depending on the specific circumstances and the application conditions. In no respect should they be generalized to derive a uniform and standard conclusion. For example, a single sensor controlling a multiple valves might even be the most complex of all, if the single sensor bears the task to sense the individual status of the multiple valves, and then used to individually control each of the valves according to individually designed criteria. This is a task which to some level of skill in the art may seem not to be feasible, but in fact *not impossible*, since it can be solved, e.g., using *computer controlled multiplexing*. Thus, while obviousness has to be judged on an individual basis, it also depends strongly on the individual level of skill in the art. If the Applicant's skill in the art is less than ordinary, he/she would --of course-- mistakenly deny that even the simplest combination were obvious. In reality the combination is non-obvious only to the Applicant, but quite obvious to those of ordinary skilled in the art. Therefore, the correct standard to judge the obviousness of a combination is neither Applicant's nor the Examiner's level of skill in the art, but the ordinary level of skill in the art.

Under these circumstances, the Examiner realizes that one of ordinary skill in the art needs indeed an abnormally high degree of fantasy, or imagination, to create such a self-deceptive illusion to "see" in the Examiner's reason and motivation for combining the cited prior art references any slightest resemblance with the *In re Kotzab* case, because they are fully unrelated and share nothing in common. It is interesting to notice

that such an abnormally high degree of imagination is well correlated to the unprofessional and non-technical virtues shown repeatedly by Applicant along this examination process. While this knowledge is very useful to obtain a fair estimate of Applicant's level of skill in the art, this level would not have any impact on the patentability of the claimed invention.

19. The same illusionary vision can also be attributed to Applicant's lengthy arguments on pages 20-21, in which a large number of fully irrelevant case laws were cited, where in fact a general motivation for combining Danell's heater coil with Wilson's coaxial heat exchanger --as recited in the previous Office Action-- was simply based on heat-exchange being a conventional technique well known in the art. On the level of ordinary skill in the art, this inherently means that no auxiliary teaching is required for combining the two cited prior arts, since both refer to the same subject matter of heating a gas in a capillary or conduit. There is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971). In other words, the references are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. *In re Bozek*, 163 USPQ 545 (CCPA) 1969. In the present case the rationale is reasoned from knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). This relates to suggestion/motivation in that

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"having established that this knowledge was in the art, the Examiner could then properly rely on a conclusion of obviousness 'from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference'." In re Bozek, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969).

Again, in the above conclusion of obviousness, the correct standard to judge the Danell & Wilson combination was neither Applicant's nor the Examiner's level of skill in the art, but the ordinary level of skill in the art.

20. Regarding New Matter addressed in Applicant's Response (Paper No.6/A) at the end of page 21, the Examiner agrees to disregard the issue, based on the fact that Applicant has adequately defined his "detector" to inherently include a mass spectrometer.

21. Applicant's argument recited on page 22, Paper No. 6/A, refers back --over claim dependencies-- to the previously rejected independent claims, which are now moot because of the present new ground of rejections.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

22. Claims 39-45, 47, and 49-52 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Verentchikov et al. (USPAT # 6,504,150).

Regarding independent claims 39 and 47 (having identical limitations that differ only slightly in their preambles) and method claim 52, Verentchikov et al. disclose an apparatus having mass analysis and detection capabilities, comprising:

(a) a matrix based ion source 11c (with target 13) for producing analyte ions, as shown in Fig.4A, as recited in Col.7/ll.32-34;

(b) an ion detector inherent in mass spectrometer/analyzer 44, downstream from the ion source 11c, for detecting enhanced analyte ions, as recited in Col.7/ll.45-55;

(c) an ion enhancement system 40 interposed between the ion source 11c (or 13) and the detector (MS) 44, for enhancing the analyte ions, as recited in Col.7/ll.33-39; and

(d) an ion transport system 42 adjacent to the ion enhancement system 40 for transporting the enhanced analyte ions from the ion enhancement system 40 to the ion detector (MS) 44.

Note: Although different elements may be found as examples or embodiments in the specification, they were not claimed explicitly. Nor were the words that are used in the claims defined in the specification to require these limitations. A reading of the specification provides no evidence to indicate that these limitations must be imported

into the claims to give meaning to disputed terms. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In other words, the claim limitations are too broadly formulated, thereby failing to particularly point out the claimed invention, while trying to claim everything that is already obvious in the prior arts, i.e., not invented by Applicant.

► Regarding claim 40, Verentchikov's ion detector is (an inherent part of) a mass spectrometer 44, as recited in Col.7/ll.45-48.

► Regarding claims 41 and 42, Verentchikov's ion enhancement system 46 shown in embodiment Fig.4C comprises & encloses a portion of the ion transport system (RF-multipole guide 42 in Fig. 4A and 45 in Fig.4B), as recited in Col.8/ll.57-60, Col.7/ll.35-40 and Col.8/ll.30-36, whereby the enhancement effect (breaking up molecular clusters) is specifically recited in Col.8/ll.32-36. ***Note: the limitation of claims 41 and 42 does not recite any coaxial heat-exchange structure, and hence, is here interpreted in its broadest sense.***

► Regarding claim 43, Verentchikov's ion enhancement system 40 shown in embodiment Fig.4A comprises a portion of the ion source 11c, as recited in Col.7/ll. 32-36, whereby the enhancement effect (breaking up molecular clusters) is specifically recited in Col.7/ll.36-39.

► Regarding claims 44 and 49, Verentchikov's ion enhancement system 40 comprises one conduit, as recited in Col.7/ll.34-35.

► Regarding claims 45 and 50, Verentchikov's ion enhancement system 40 comprises one gas source connected to gas inlet port 21 in Fig.4A, B, C, which is equivalent to the same port 21 in Fig.2, as recited in Col.5/ll.10-20.

► Regarding claim 51, Verentchikov's ion enhancement system 40 is a collecting capillary, as shown in Fig.4A.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. Claims 46 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verentchikov et al.

► Regarding claims 46 and 51, Verentchikov's ion collecting capillary 40 can simultaneously serve as ion transport system to deliver enhanced ions the mass sensitive detector 44, i.e., by eliminating RF quadrupole 42 from Fig.4A, which is here not needed, as generally known to one of ordinary skill in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to eliminate the RF quadrupole ion transport system 42 from the embodiment shown in Fig.4A, in case a short ion transit constrained by a compact spectrometer design is desired.

24. Claims 1-22, 25-27, 29-38, 53, 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verentchikov et al. in view of Laiko et al. (Anal. Chem. 2000,

Vol.72, pp.5239 ff.), hereafter denoted by Laiko-II (IDS), and further by Willoughby (USPAT # 4,968,885), hereafter denoted as Willoughby-885.

Regarding claim 11, Verentchikov et al. disclose a mass spectrometer that produces enhanced analyte ions for ease of detection, comprising:

- (a) a matrix based ion source 11c (with target 13) for producing and discharging analyte ions to an ion region (between target 13 and collecting capillary 40), as shown in Fig.4A, as recited in Col.7/ll.32-34;
- (b) a collecting capillary 40 downstream from both matrix based ion source 13 and the ion region for receiving the analyte ions produced, as recited in Col.7/ll.32-48;
- (c) a gas source connected to gas inlet port 21 in Fig.4A, B, C, which is equivalent to the same port 21 in Fig.2, as recited in Col.5/ll.10-20;
- (d) a conduit for conducting the gas from the source towards the ion region between target 13 and collecting capillary 40, which is no other than inlet port 21 forming the end of the conduit, as is trivially understood by one of ordinary skill in the art from the geometry shown in Fig.4A, and providing ion enhancement to the analyte ions in the ion region before entering the collecting capillary 40, again as trivially understood by one of ordinary skill in the art from the geometry of Fig.4A; and
- (e) a detector inherent in mass spectrometer/analyzer 44, downstream from the collecting capillary 40 for detecting analyte ions received and enhanced by the collecting capillary 40, as recited in Col.7/ll.45-55;
- (c) an ion enhancement system 40 interposed between the ion source 11c (or 13) and the detector (MS) 44, for enhancing the analyte ions, as recited in Col.7/ll.33-39; and

(d) an ion transport system 42 adjacent to the ion enhancement system 40 for transporting the enhanced analyte ions from the ion enhancement system 40 to the ion detector (MS) 44.

Note: Although different elements may be found as examples or embodiments in the specification, they were not claimed explicitly. Nor were the words that are used in the claims defined in the specification to require these limitations. A reading of the specification provides no evidence to indicate that these limitations must be imported into the claims to give meaning to disputed terms. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In other words, the claim limitations are too broadly formulated, thereby failing to particularly point out the claimed invention, while trying to claim everything that is already obvious in the prior arts, i.e., not invented by Applicant.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to design the end of the gas conduit, i.e., port 21 in Fig.4A, as near as possible to the ion region between target matrix 13 and collecting capillary 40, so the pulsed gas pressure synchronized with the laser pulse (in a particular embodiment) will *effectively drag* the ionized analytes towards the inlet opening of the collecting capillary 40, as recited by Verentchikov in Col. 4/II.44-48, Col.5/II.21-40, and more specifically Col.7/II.32-55.

- ▶ Claims 1 and 36-38 recite limitations that are entirely covered by those of claim 11, and are therefore rejected by the same reason over the same prior arts.
- ▶ Especially regarding claims 36-38, 53 and 55, the conduit for conducting the gas from the source towards the ion region may be extended further beyond the inlet port,

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as rendered obvious by Laiko-II, showing in Fig.1 an unlabeled conduit (after the arrow denoting N₂), as recited on pg.5240/Col.2/lines 11-16. In addition, a conduit is rendered obvious by Willoughby-885, showing in Fig.5 a conduit 67 for heating the target 50 and built proximate to it, as recited in Col.14/ll.4-16, having a purpose to deliver an alternative energy source, i.e., including a heated gas, as generally known in the art, to the target surface 50, as recited in Col.14/ll.45-50. Such a heated gas is a direct gas-to-gas contact heating explicitly recited in Applicant's claims 36-38, 53 and 55.

Although Willoughby-885's apparatus & method include other features beyond the present invention, e.g., a preceding part for introducing liquid sample to be condensed on target surface 50, those features may be simply discarded because they are not needed. The only teaching here adopted to modify Verentchikov's begins with condensed bio molecules on target surface 50, which represents, or is replaced by, Verentchikov's matrix 13. Such an omission of an element and/or its function is obvious if the function of the element is not desired/required/intended. *Ex Parte Wu*, USPQ 2031 (Bd. Pat. App. & Inter. 1989).

With regard to Willoughby-885's purpose being different than Applicant's intended use, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Furthermore, regarding the fact that Applicant's intended use is different than Willoughby-885's, a recitation of the intended use of a claimed invention must result in a

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structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making (method claim), the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). By all means, Willoughby-885's structure is capable of performing Applicant's intended use, then it meets Applicant's claim(s). Furthermore, Applicant's claimed method does not result in a manipulative difference as compared to Willoughby-885's. So Willoughby-885 renders Applicant's apparatus and method obvious.

► Specifically regarding claim 22, to provide Laiko-II and/or Willoughby-885's heated gas, it is conventional to heat the gas source, as generally known in the art.

► Specifically regarding claims 2 and 12, Verentchikov's ion source 11c in Fig.4A, or 10 in Fig.1, is a MALDI ion source, as recited in Col.1/II.9-17, Col.2/II.19-56, Col.3/II.1-16 and Col.4/II.17-20.

► Specifically regarding claims 3 and 13, the use of fast atomic bombardment is recited by Willoughby in Col.14/II.41-42.

► Specifically regarding claims 4, 5, 8, 14, 15 and 18, Verentchikov's ion source 11c in Fig.4A, or 10 in Fig.1, is a MALDI ion source operating at atmospheric pressure (APMALDI) or an ion source operating at atmospheric pressure, as recited in Col.14/II.48-51 (claim 10), and in Col.14/II.45-47 (claim 9).

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- ▶ Specifically regarding claims 6, 9, 16 and 19, Verentchikov's ion source 11c in Fig.4A, or 10 in Fig.1, operates below atmospheric pressure, as recited in Col.1/II.12-17 & Col.2/II.35-45.
- ▶ Specifically regarding claims 7, 10, 17 and 20, Verentchikov's MALDI ion source 11c in Fig.4A, or 10 in Fig.1, is inherently capable of operating above atmospheric pressure.
- ▶ Specifically regarding claim 21, Verentchikov's conduit 21 is a port, and Willoughby-885's conduit 67 is a pipe or nozzle.
- ▶ Specifically regarding claim 25, Verentchikov's conduit 21 is adjacent to the collecting capillary 40.
- ▶ Specifically regarding claims 26 and 56, Willoughby's heating gas temperature is about 100 °C, as recited in Col.14/II.31-36 in view of Col.14/II.28-31, whereas Verentchikov's temperature range is between 150 and 250 °C, as recited in the Abstract and in Col.2/II.44-47. Both specified temperature ranges overlap with the temperature range claimed by Applicant (60 and 150 °C).
- ▶ Specifically regarding claims 27 and 30, Laiko-II's heating gas is nitrogen (N₂), which is a diatomic molecule, as recited on pg.5240, column 2, lines 11-16.
- ▶ Specifically regarding claims 29-32, it is well known in the art that Laiko-II's as well as Willoughby's gas may be substituted by a monatomic, triatomic or polyatomic molecule. Suggestion and motivation for the modification of Willoughby's nitrogen gas is here based on a general knowledge of ordinary skilled in the art, and does not have

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to be expressly stated in the prior arts; in the present case the rationale is reasoned from knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

► Specifically regarding claim 33, the use of a coupling for joining together different parts of a vacuum apparatus is conventional, and hence, well known in the art, whereas the choice of a particular coupling design is a mere matter of design choice that only involves routine skill in the art, and hence, unpatentable.

► Specifically regarding claims 34 and 35, the limitation of a housing with capillary cap and spacer disposed in it, is rendered obvious by Laiko-II, trivially showing a housing 5 shown in Fig.1, as recited on pg.5240/II.1-10 of the Experimental Section..

25. Claims 28, and 57-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verentchikov et al. in view of Laiko-II and Willoughby-885, and further in view of Laiko et al. (IDS), hereafter denoted as Laiko-I (Anal. Chem. 2000, Vol. 72, pp.652 ff.).

Verentchikov et al. as modified by Laiko-II and Willoughby-885 recites all the limitations of claims 28 and 57-59, as previously applied to the respective parent claims 11 and 47, except the recitation of a gas flow rate of 2L/min. to 15L/min. (claim 57), an ionization volume of 1-5 mm³ (claim 28), and a distance of between 1mm to 5mm between conduit and matrix based ion source (claim 58).

Laiko-I discloses a matrix based ion source for mass spectrometry in which laser desorption is used, as recited on pg.652/lines 1-5.

Laiko-I's ionization region, located between Laiko-I's 3/4/5, capillary 2, and gas nozzle 7, as already identified previously, has an area of $(0.7-1.6 \text{ mm}^2)$, as recited by Laiko-I in the last line on pg.653/Col.1. Verentchikov's collecting aperture has a dimension of about 1mm as recited in Col.5/ll.30-35. Hence, the ionization volume is estimated to be between $1-1.6 \text{ mm}^3$, which approximately overlaps with the volume range claimed by Applicant, whereas the distance of Verentchikov's collecting capillary to the matrix ion source is estimated to be about the same order of magnitude as the diameter, or larger, i.e., $> 1\text{mm}$, which also overlaps with the distance as claimed by Applicant.

► Specifically regarding claim 57, the gas flow rate is particularly determined by the pumping capacity of the mass spectrometer, as generally known in the pertinent art. Verentchikov's pumping capacity is 300L/sec, or 5L/min., as recited in Col.5/ll.27-29, whereas Laiko-I's gas feed is about 0.4-0.8L/min., as recited on pg.653/lines 4-10. One of ordinary skill in the art may thus estimate of a gas feed flow rate of about 1-5L/min., which essentially overlaps with the gas flow rate claimed by Applicant.

► Claim 59 recites limitations that consist of a combination of claims 47 and 55-58. Therefore, claim 59 is rejected by the same reason over the same prior arts as applied previously to claims 47 and 55-58.

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26. Claims 23, 24 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verentchikov et al. in view of Laiko-II and Willoughby-885, and further in view of Whitehouse et al. (USPAT # 5,962,851) and Wilson Jr. (USPAT # 5,022,379).

Verentchikov et al. as modified by Laiko-II and Willoughby-885 recites all the limitations of claims 23 and 24, as previously applied to the respective parent claim 11, except the recitation of the collecting capillary being enclosed by the conduit, at least partially.

Verentchikov's collecting capillary 40 is heated by an unspecified temperature source 19, as recited in Col.6/ll.25-31. However, Verentchikov's conduit 21 does not enclose the collecting capillary 40.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat ions or gas flowing along a capillary/tube by a heating-gas flowing in a conduit which encloses the ion collecting capillary, which is rendered obvious by Whitehouse et al., showing in Fig.1 a collecting capillary 4 enclosed by a conduit 23, thus forming a coaxial heat exchanger, as recited in Col.7/ll.62-66.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat ions or gas flowing along a capillary/tube by a counter-propagating heat-gas flow forming a coaxial heat exchanger with counter-propagating heat-gas flow, since such coaxial heat exchanger is conventional and well known in the art, as disclosed by Wilson Jr. in the Abstract/ll.5-11, Col.6/ll.37-68 and Col.7/ll.19-23.

Conclusion

27. Despite the obscuring effect of a senseless and unwarranted large number of similar claims with meticulously intertwined limitations that serve no purpose other than confusing the reader, while demonstrating the vagueness of the claimed invention, one of ordinary skill in the art can not be misled away from the insight that the only features distinguishing the present invention from the cited prior arts are (a) "*a coaxially heated collecting capillary to enhance analyte ions by breaking apart molecular clusters*", and (b) "*a heated gas directed to contact the analyte ions*". Regarding (a), ion enhancement by a heated collecting capillary is obvious over a large number of prior arts including Verentchikov et al., as well as Danell et al. and Laiko-I, whereas its modification in the form of coaxial heat exchanger is also obvious over Wilson and Whitehouse et al.. Regarding (b), breaking apart molecular clusters by direct gas-to-gas contact heating, i.e., through molecular collisions, is obvious over a modification by Laiko-II and/or Willoughby. Therefore, none of the claims are allowable.

Double Patenting

28. Claims 1-47, 49-56 and 58 of this application conflict with claims 1-64 of the copending Application No. 10/134,806 filed on 04/29/2002 by the same Applicant. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the

conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

Statutory Type Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

29. Claims 11-17 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 15-21, respectively, of copending Application No. 10/134,806. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

30. Claims 19-35 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 22-38, respectively, of copending Application No. 10/134,806. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

31. Claims 39-47 and 49-51 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 39-47 and 49-51, respectively, of copending Application No. 10/134,806. The limitations are effectively the same

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because of the words "*comprising*" commonly used in the claims. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

32. Claims 36-38 and 52-53 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 52-54 and 62-63, respectively, of copending Application No. 10/134,806. The limitations are effectively the same because of the words "*comprising*" commonly used in the claims. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Obviousness Type Double Patenting – No Secondary Reference(s)

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Obviousness Type Double Patenting – No Secondary Reference(s)

33. Claims 1-10, 18, 54-56 and 58 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 and various claim combinations of copending Application No. 10/134,806

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filed on 04/29/2002 by the same Applicant. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

- ▶ Claim 1 recites the same limitations as claim 1 of the copending Application, broadly interpreted as that the heat being provided by the ion source, e.g., by a laser beam (delivered through a light *conduit* or optical capillary or optical fiber), or by flash desorption (provided by heated gas delivered through a gas capillary or *conduit*).
- ▶ Claims 2-5 recite the same limitations as claims 2-5 of the copending Application, respectively.
- ▶ Claim 6 recites the same limitation as claim 7 of the copending Application.
- ▶ Claim 7 recites the same limitation as claim 6 of the copending Application.
- ▶ Claims 8-10 recites limitations that are inherent to claim 3 of the copending Application, as generally known in the art in the case of FAB ion sources.
- ▶ Claim 18 recites the same limitations as a combination of claims 22 and 23 of the copending Application.
- ▶ Claim 54 recites the same limitations as a combination of claims 62 and 26 of the copending Application.
- ▶ Claim 55 recites the same limitations as a combination of claims 47 and 52 of the copending Application.
- ▶ Claim 56 recites the same limitations as a combination of claims 47, 52 and 29 of the copending Application.
- ▶ Claim 58 implicates the limitations of a combination of claims 47, 52 and 31 of the copending Application.

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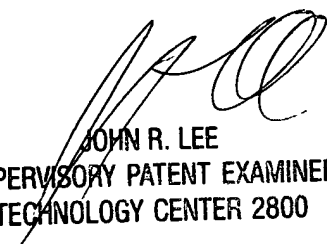
This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 703 305 0149. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes
June 9, 2003


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
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